



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/664,458

09/18/2003

Shunpei Yamazaki

0553-0379

4357

7590

06/14/2005

COOK, ALEX, MCFARRON, MANZO,  
CUMMINGS & MEHLER, LTD.

Suite 2850

200 West Adams St.

Chicago, IL 60606

EXAMINER

RAABE, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/664,458	<b>Applicant(s)</b> YAMAZAKI ET AL.	
	<b>Examiner</b> Christopher M. Raabe	<b>Art Unit</b> 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.  
     4a) Of the above claim(s) 16-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/18, 5/18, 8/16</u> . | 6) <input type="checkbox"/> Other: ____  |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-15, drawn to a light-emitting device, classified in class 313, subclass 503.
  - II. Claims 16-22, drawn to a method of manufacturing, classified in class 445, subclass 52.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, one of ordinary skill in the art would be able to heat the light-emitting device in an inert gas at atmospheric pressure, instead of under a vacuum atmosphere. One of ordinary skill in the art would also be able to form the device without a heating step.

3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mark Murphy on May 24, 2005 a provisional election was made with traverse to prosecute the invention of a light-emitting device, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 16-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Claim Objections***

6. Claim 13 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

#### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1,9-12,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama (U.S. Pre-grant Publication 2001/0002703, in view of Himemisha et al. (Japanese Patent 09-235546).

With regard to claim 1,

Koyama discloses a light-emitting device comprising: a first passivation film (paragraph 234) and a second passivation film (paragraph 242); and a light-emitting element formed between the first passivation film and the second passivation film (paragraph 241), wherein the light-emitting element comprises an anode, a cathode and a light-emitting layer between the anode and the cathode (paragraph 241); wherein the light-emitting layer comprises a dopant (paragraph 8)

Koyama does not disclose the dopant at a concentration of 0.1% by weight or more and 0.4% by weight or less.

Himemisha et al. do disclose a dopant at a concentration of 0.1% by weight or more and 0.4% by weight or less (paragraph 19, and embodiment 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the concentration disclosed in Himemisha et al. into the device of Koyama in order to avoid a concentration quenching effect (paragraph 19 of Himemisha et al.).

9. Claims 2,9-12,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagata (U.S. Pre-grant Publication 2002/0070385), in view of Koyama (as above) and Himemisha et al. (as above).

With regard to claim 2,

Yamagata discloses a light-emitting device comprising: a photosensitive organic resin film having an opening (paragraph 97, and 939 of figs 9); and a light-emitting element having an anode, a cathode and a light-emitting layer between the anode and the cathode (paragraph 6); wherein the anode, the cathode and the light-emitting layer are overlapped in an opening in the photosensitive organic resin layer (fig 9c).

Yamagata does not disclose a first passivation film and a second passivation film; wherein an anode and a resin film are formed on the first passivation film; wherein the resin film and the cathode are covered with the second passivation film; nor a light-emitting layer comprising a dopant at a concentration of 0.1% by weight or more and 0.4% by weight or less.

Koyama does disclose a first passivation film (paragraph 321) and a second passivation film (paragraph 331); wherein an anode and a resin film are formed on the first passivation film (paragraphs 323,324); wherein the resin film and the cathode are covered with the second passivation film (paragraph 331 and fig. 16c).

Himemisha et al. do disclose a light-emitting layer comprising a dopant at a concentration of 0.1% by weight or more and 0.4% by weight or less (paragraph 19, and embodiment 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the dopant concentration, as disclosed by Himemisha et al., and the combination of first and second passivation films, as disclosed by Koyama, into the device of Yamagata in

Art Unit: 2879

order to avoid a concentration quenching effect (paragraph 19 of Himemisha et al.), relieve spacer pressure and protect the light-emitting element (paragraphs 223 and 242).

With regard to claim 9,

Koyama or Yamagata disclose a light-emitting device.

Neither Koyama nor Yamagata explicitly disclose the light-emitting element, after turning on for 100 hr with an initial intrinsic brightness set at  $320 \text{ cd/mm}^2$  and a duty ratio set at 70%, having a diminishing amount of the intrinsic brightness of substantially 10% or less of the initial intrinsic brightness.

However, the light-emitting element, after turning on for 100 hr with an initial intrinsic brightness set at  $320 \text{ cd/mm}^2$  and a duty ratio set at 70%, having a diminishing amount of the intrinsic brightness of substantially 10% or less of the initial intrinsic brightness is a property of the light-emitting device, does not structurally differentiate the light-emitting device from the prior art, and is therefore not given patentable weight.

With regard to claim 10,

Koyama or Yamagata disclose a light-emitting device.

Neither Koyama nor Yamagata explicitly disclose the light-emitting element, after turning on for 1000 hr with an initial intrinsic brightness set at  $320 \text{ cd/mm}^2$  and a duty ratio set at 70%, has a diminishing amount of the intrinsic brightness of substantially 20% or less of the initial intrinsic brightness.

However, the light-emitting element, after turning on for 1000 hr with an initial intrinsic brightness set at  $320 \text{ cd/mm}^2$  and a duty ratio set at 70%, having a diminishing amount of the intrinsic brightness of substantially 20% or less of the initial intrinsic brightness is a property of

Art Unit: 2879

the light-emitting device, does not structurally differentiate the light-emitting device from the prior art, and is therefore not given patentable weight.

With regard to claim 11,

Koyama or Yamagata disclose a light-emitting device, wherein the light-emitting device includes a transistor that controls a current that is supplied to the light-emitting element (paragraph 4 of Koyama, or paragraph 17 of Yamagata), wherein both the light-emitting element and the transistor are plurally disposed in a pixel portion of the light-emitting device (fig 2 of Koyama, and fig 5 of Yamagata), wherein the pixel portion is disposed on a substrate (paragraph 2 of Koyama, or paragraph 2 of Yamagata).

Neither Koyama nor Yamagata explicitly disclose the light-emitting element wherein when brightness is set at 200 nt when a duty ratio is set at 70%, a temperature of a portion that overlaps with the pixel portion of the substrate is 40 degree centigrade or less.

However, a temperature of a portion that overlaps with the pixel portion of the substrate being 40 degree centigrade or less when brightness of the light-emitting element is set at 200 nt when a duty ratio is set at 70% is a property of the light-emitting device, does not structurally differentiate the light-emitting device from the prior art, and is therefore not given patentable weight.

With regard to claim 12,

Koyama or Yamagata disclose a light-emitting device, wherein the light-emitting device includes a transistor that controls a current that is supplied to the light-emitting element (paragraph 4 of Koyama, or paragraph 17 of Yamagata), wherein both the light-emitting element and the transistor are plurally disposed in a pixel portion of the light-emitting device



Art Unit: 2879

(fig 2 of Koyama, and fig 5 of Yamagata), wherein the pixel portion is disposed on a substrate (paragraph 2 of Koyama, or paragraph 2 of Yamagata).

Neither Koyama nor Yamagata disclose a temperature of a portion that overlaps with the pixel portion of the substrate being 40 degree centigrade or less when power consumption of the light-emitting element and the transistor is set at 600 mW when a duty ratio is set at 70%.

However, a temperature of a portion that overlaps with the pixel portion of the substrate being 40 degree centigrade or less when power consumption of the light-emitting element and the transistor is set at 600 mW when a duty ratio is set at 70% is a property of the light-emitting device, does not structurally differentiate the light-emitting device from the prior art, and is therefore not given patentable weight.

With regard to claim 14,

Koyama or Yamagata disclose a light-emitting device, wherein the light-emitting device includes a transistor that controls a current that is supplied to the light-emitting element (paragraph 4 of Koyama, or paragraph 17 of Yamagata), wherein both the light-emitting element and the transistor are plurally disposed in a pixel portion of the light-emitting device (fig 2 of Koyama, and fig 5 of Yamagata), wherein the pixel portion is disposed on a substrate (paragraph 2 of Koyama, or paragraph 2 of Yamagata).

Neither Koyama nor Yamagata disclose a temperature of a portion that overlaps with the pixel portion of the substrate being 35 degree centigrade or less when power consumption of the light-emitting element and the transistor is set at 400 mW when a duty ratio is set at 70%.

However, a temperature of a portion that overlaps with the pixel portion of the substrate being 35 degree centigrade or less when power consumption of the light-emitting element and the transistor is set at 400 mW when a duty ratio is set at 70% is a property of the light-emitting

Art Unit: 2879

device, does not structurally differentiate the light-emitting device from the prior art, and is therefore not given patentable weight.

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagata, Koyama and Himemisha et al. as applied to claim 2 above, and further in view of Yamazaki et al. (U.S. Pre-grant Publication 2002/0074936).

With regard to claim 3

Yamagata discloses a light-emitting device and a photosensitive organic resin (insulating) film, having an opening.

Yamagata does not disclose a radius of curvature of a curve that a section in the opening of the insulating (photosensitive organic resin) film depicts being in the range of from 0.2 to 2  $\mu\text{m}$ .

Yamazaki et al. do disclose a radius of curvature of a curve that a section in the opening of the insulating film depicts being in the range of from 0.2 to 2  $\mu\text{m}$  (paragraph 31).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagata, Koyama and Himemisha et al. as applied to claim 2 above, and further in view of Yamazaki et al. (U.S. Patent 6359320).

With regard to claim 4,

Yamagata discloses a light-emitting device.

Yamagata does not disclose a light-emitting device wherein the photosensitive organic resin film has positive photosensitivity.

Yamazaki et al. do disclose a light-emitting device wherein the photosensitive organic resin film has positive photosensitivity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the photosensitivity range disclosed in Yamazaki et al. into the device of Yamagata to allow small changes in the conductivity of the organic resin film.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagata, Koyama, and Himemisha et al. as applied to claim 2 above, and further in view of Tamai et al. (U.S. Patent 5793497).

With regard to claim 5,

Yamagata discloses a light-emitting device.

Yamagata does not disclose a light-emitting device wherein the photosensitive organic resin film has negative photosensitivity.

Tamai et al. do disclose a photosensitive organic resin film having negative photosensitivity (column 3, line 64 – column 4, line 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the photosensitivity range disclosed in Tamai et al. into the device of Yamagata in order to lower the conductivity of the organic resin film.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama and Himemisha et al., or Yamagata, Koyama and Himemisha et al. as applied to claim 1 or 2 above, respectively, and further in view of *Producing Monolithic Light Emitting Diode Display Chips* (IBM Technical Disclosure Bulletin Vol. 16, Issue 1, Pg. 6, 6/1/1973).

With regard to claim 6,

Koyama discloses a light-emitting device, wherein at least one of the first passivation film and the second passivation film is a carbon nitride film or a silicon nitride film (paragraph 242),

Koyama does not disclose forming a passivation film by an RF sputtering process.

Forming a passivation film by an RF sputtering process is disclosed in *Producing Monolithic Light Emitting Diode Display Chips*.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the RF sputtering process into the device of Koyama or Yamagata, in order to efficiently deposit the film.

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama and Himemisha et al., or Yamagata, Koyama and Himemisha et al. as applied to claim 1 or 2 above, respectively, and further in view of Jones et al. (U.S. Patent 6069443).

With regard to claim 7,

Koyama or Yamagata disclose the light-emitting device.

Neither Koyama nor Yamagata disclose a passivation film comprising a material selected from the group consisting of DLC, boron nitride and alumina.

Jones et al. do disclose a passivation film comprising a material selected from the group consisting of DLC, boron nitride and alumina (column 8, lines 34-40).

It would have been obvious to incorporate the material of Jones et al. into the device of either Koyama or Yamagata in order to provide good resistance to wear, electrical insulation and thermal conductivity.

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama and Himemisha et al., or Yamagata, Koyama and Himemisha et al. as applied to claim 1 or 2 above, respectively, and further in view of Admission (Applicant's Admitted Prior Art).

With regard to claim 8,

Koyama or Yamagata disclose a light-emitting device, wherein the light-emitting device includes a transistor that controls a current that is supplied to the light-emitting element (paragraph 4 of Koyama, or paragraph 17 of Yamagata).

Neither Koyama nor Yamagata disclose a transistor being operated in a saturation region.

Admission does disclose a transistor being operated in a saturation region (page 2, lines 3-6).

It would have been obvious to one of ordinary skill in the art to incorporate the operation disclosed in Admission into the device of Koyama or Yamagata in order to prevent the decline of luminance (page 2, lines 3-6 of Admission).

16. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koyama and Himemisha et al., or Yamagata, Koyama, and Himemisha et al. as applied to claim 1 or 2 above, and further in view of Tamano et al. (U.S. Patent 5968675).

With regard to claim 15,

Koyama or Yamagata disclose a light-emitting device.

Neither Koyama nor Yamagata disclose the light-emitting layer comprising a quinacridone derivative.

Tamano et al. do disclose a light-emitting layer comprising a quinacridone derivative (column 25, line 59 – column 26, line 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the substance disclosed by Tamano et al. into the device of Koyama or Yamagata in order to provide good heat, light and migration fastness, and good weathering.

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 5866919, 5320878, 3531856, U.S. Pre-grant Publication 2001/0004469.

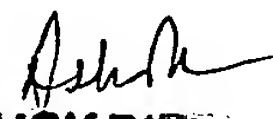
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2879

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR

  
**ASHOK PATEL**  
**PRIMARY EXAMINER**